

FIG. 1

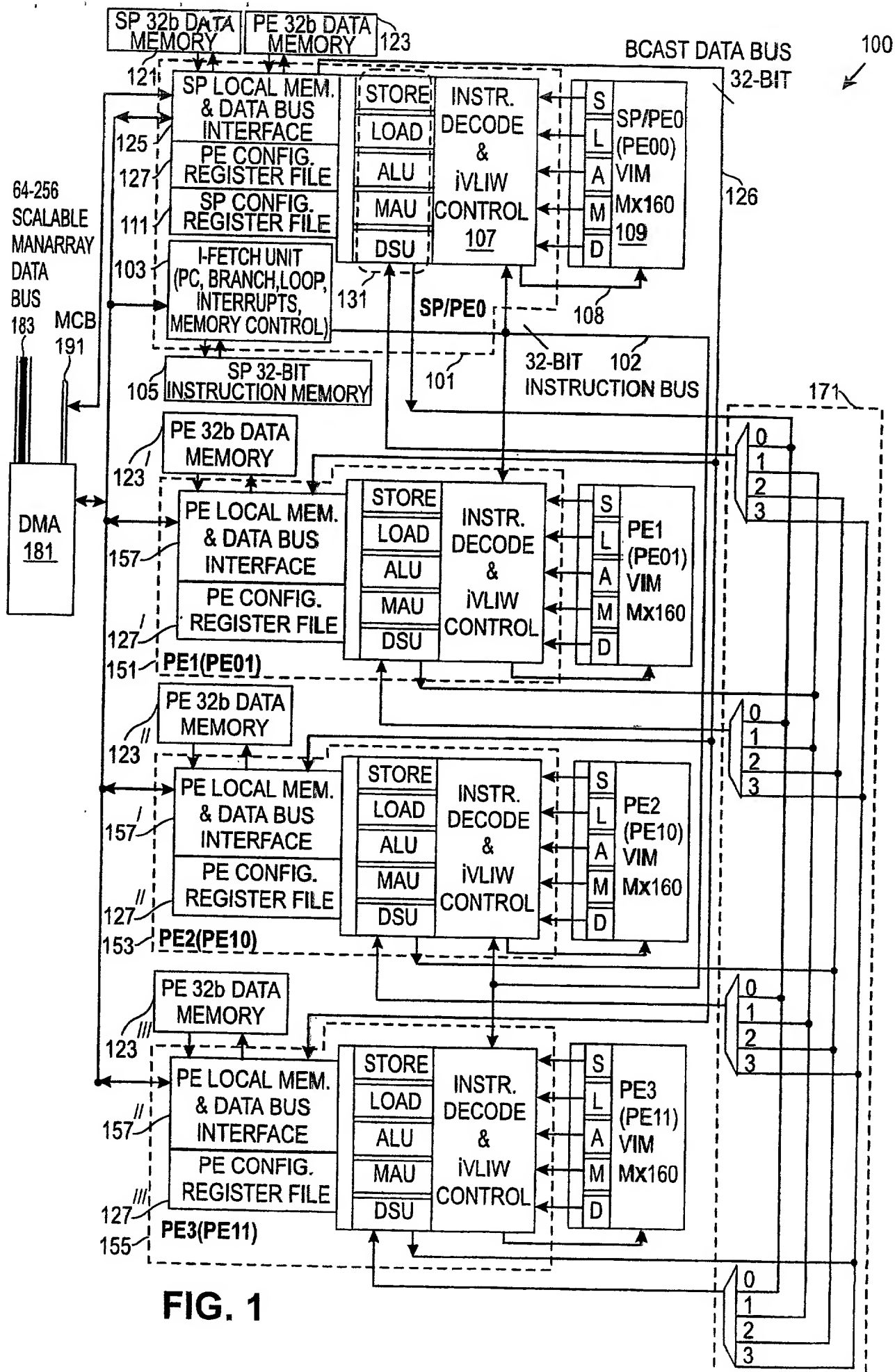


FIG. 1

## MPYCXL - Multiply Complex Long

Encoding

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group				S/P		Unit		MAUopcode				Rte		0		Rx				Ry				CE3		ME					

Fig. 2A

Syntax/Operation

Instruction	Operands	Operation	ACF
Dual Halfwords			
MPYCXL.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXL.[NVZ].[SP]M.2SH	Rte, Rx, Ry	$Rto \leftarrow (Rx.H1 * Ry.H1 - Rx.H0 * Ry.H0)$ $Rte \leftarrow (Rx.H1 * Ry.H0 + Rx.H0 * Ry.H1)$	F1 F0
[TF].MPYCXL.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on the least significant operand (Rte))

C = No effect

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Cycles: 2

Fig. 2B

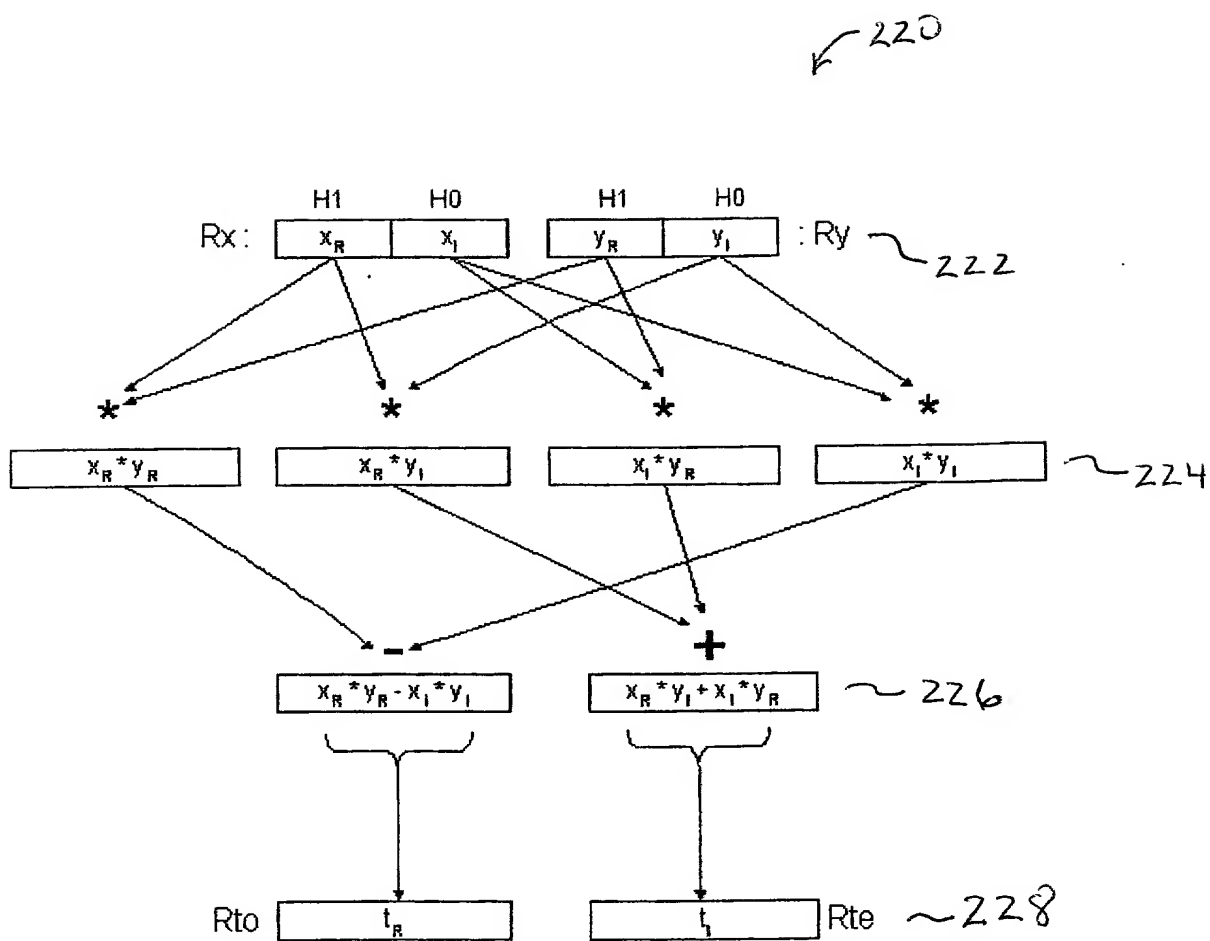


Fig. 2C

## MPYCXJL - Multiply Complex Conjugate Long

Encoding

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group	S/P	Unit	MAU	Opcode							Rte	0			Rx							Ry		CE3	ME						

Fig. 3A

Syntax/Operation

Instruction	Operands	Operation	ACF
Dual Halfwords			
MPYCXJL.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXJL.[NVZ].[SP]M.2SH	Rte, Rx, Ry	$Rto \leftarrow (Rx.H1 * Ry.H1 + Rx.H0 * Ry.H0)$ $Rte \leftarrow (Rx.H0 * Ry.H1 - Rx.H1 * Ry.H0)$	F1 F0
[TF].MPYCXJL.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on least significant operation (Rte) or as specified)

C *Not affected*

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Cycles: 2

Fig. 3B

10004010-110101

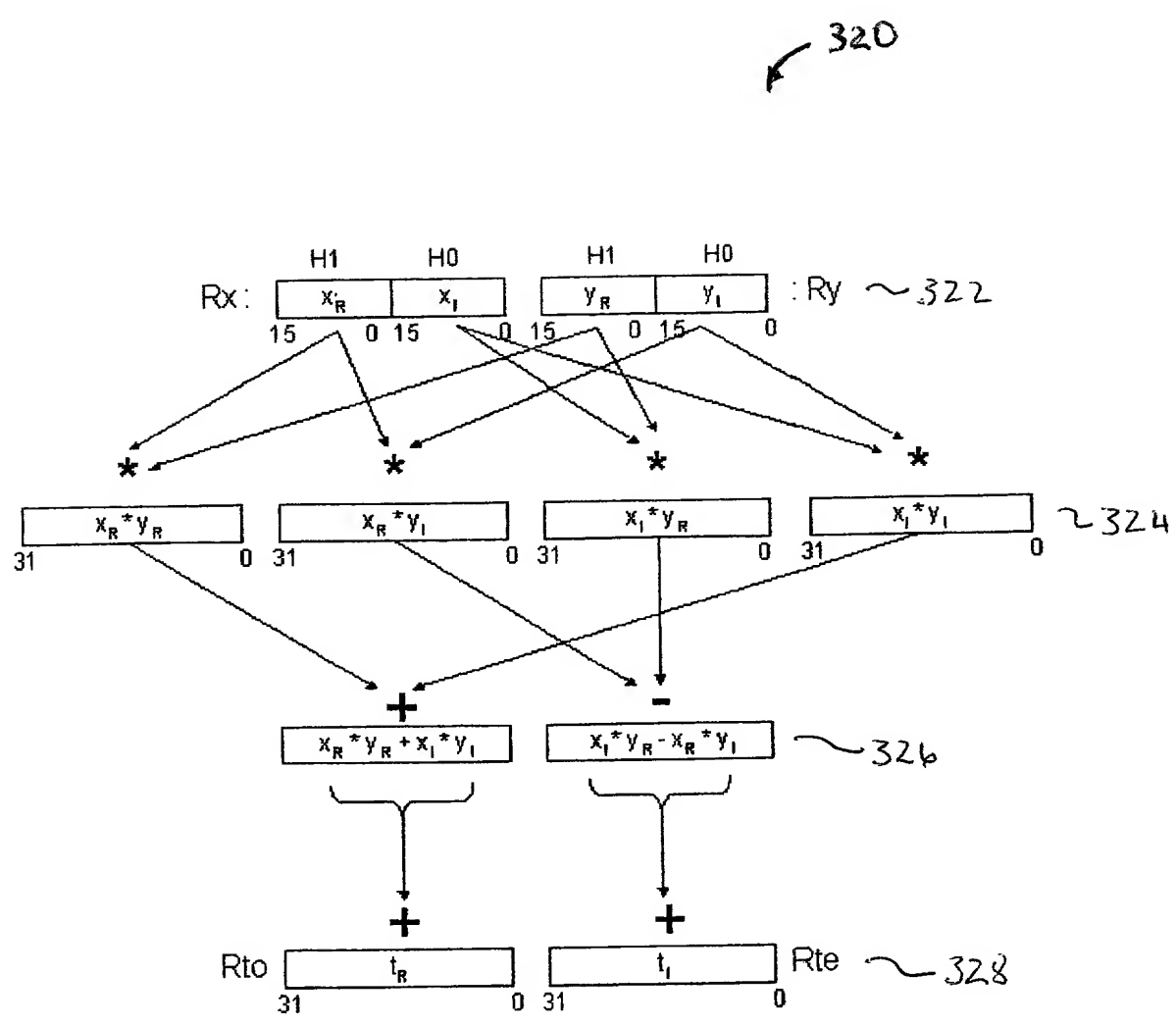


Fig. 3C

400

## MPYCXLA - Multiply Complex Long Accumulate

Encoding

Encoding																															
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group		S/P		Unit		MAUopcode						Rte		0		Rx				Ry		CE3		ME							

Fig. 4A

410

Syntax/Operation

Instruction	Operands	Operation	ACF
Dual Halfwords			
MPYCXLA.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXLA.[NVZ].[SP]M.2SH	Rte, Rx, Ry	$Rto \leftarrow Rto + (Rx.H1 * Ry.H1 - Rx.H0 * Ry.H0)$ $Rte \leftarrow Rte + (Rx.H1 * Ry.H0 + Rx.H0 * Ry.H1)$	F1 F0
[TF].MPYCXLA.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on the least significant operand (Rte))

C Not affected

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Cycles: 2

Fig. 4B

10004010-110101

420

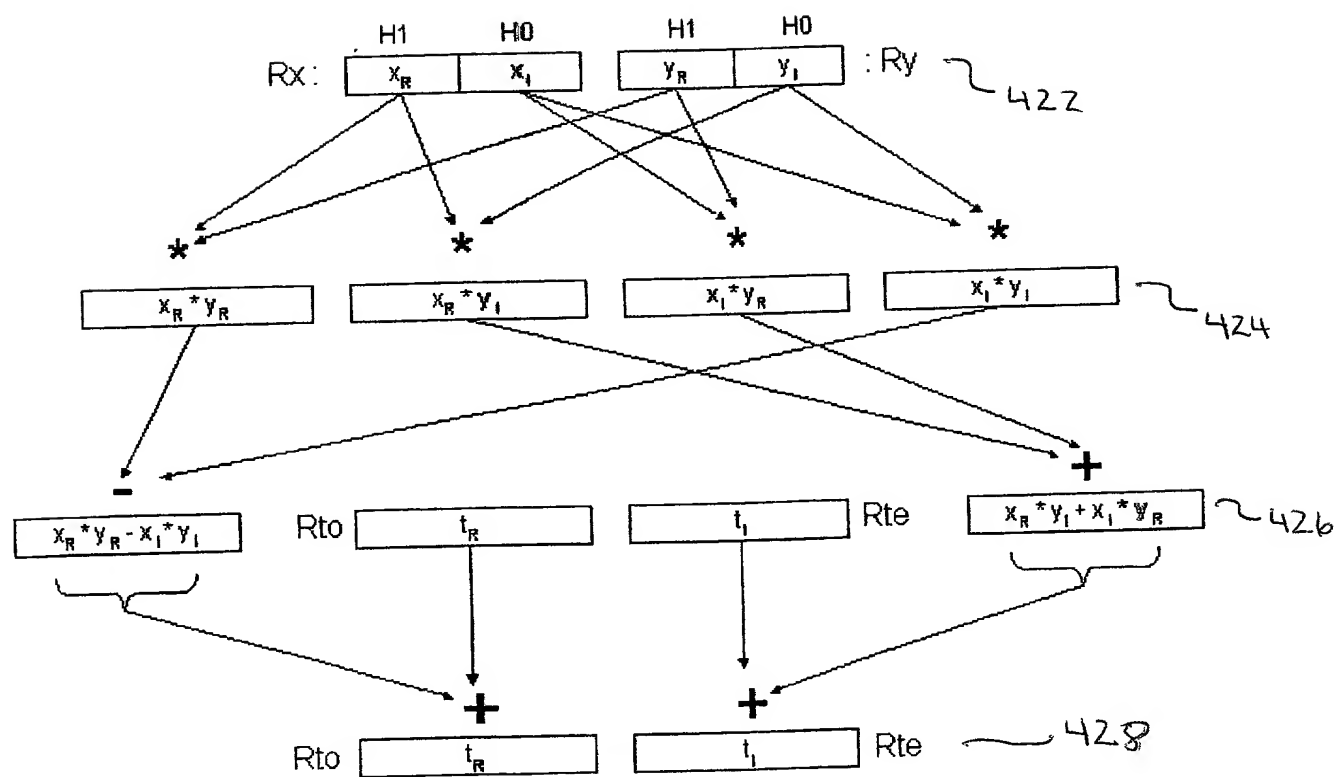


Fig. 4C

## MPYCXLJA - Multiply Complex Conjugate Long Accumulate

Fig. 5A

Encoding																															
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group		S/P		Unit		MAU				Opcode				Rte		0		Rx				Ry		CE3		ME					

510

Syntax/Operation			
Instruction	Operands	Operation	ACF
			Dual Halfwords
MPYCXJLA.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXJLA.[INVZ].[SP]M.2SH	Rte, Rx, Ry	$Rto \leftarrow Rto + (Rx.H1 * Ry.H1 + Rx.H0 * Ry.H0)$ $Rte \leftarrow Rte + (Rx.H0 * Ry.H1 - Rx.H1 * Ry.H0)$	F1 F0
[TF].MPYCXJLA.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

**Arithmetic Scalar Flags Affected** (on least significant operand (Rte))

C - Not affected

**N = MSB of result**

**V = 1 if an integer overflow occurs on either result, 0 otherwise**

**Z = 1** if a zero result is generated, **0** otherwise

**Cycles: 2**

Fig. 5B



10004010-110101

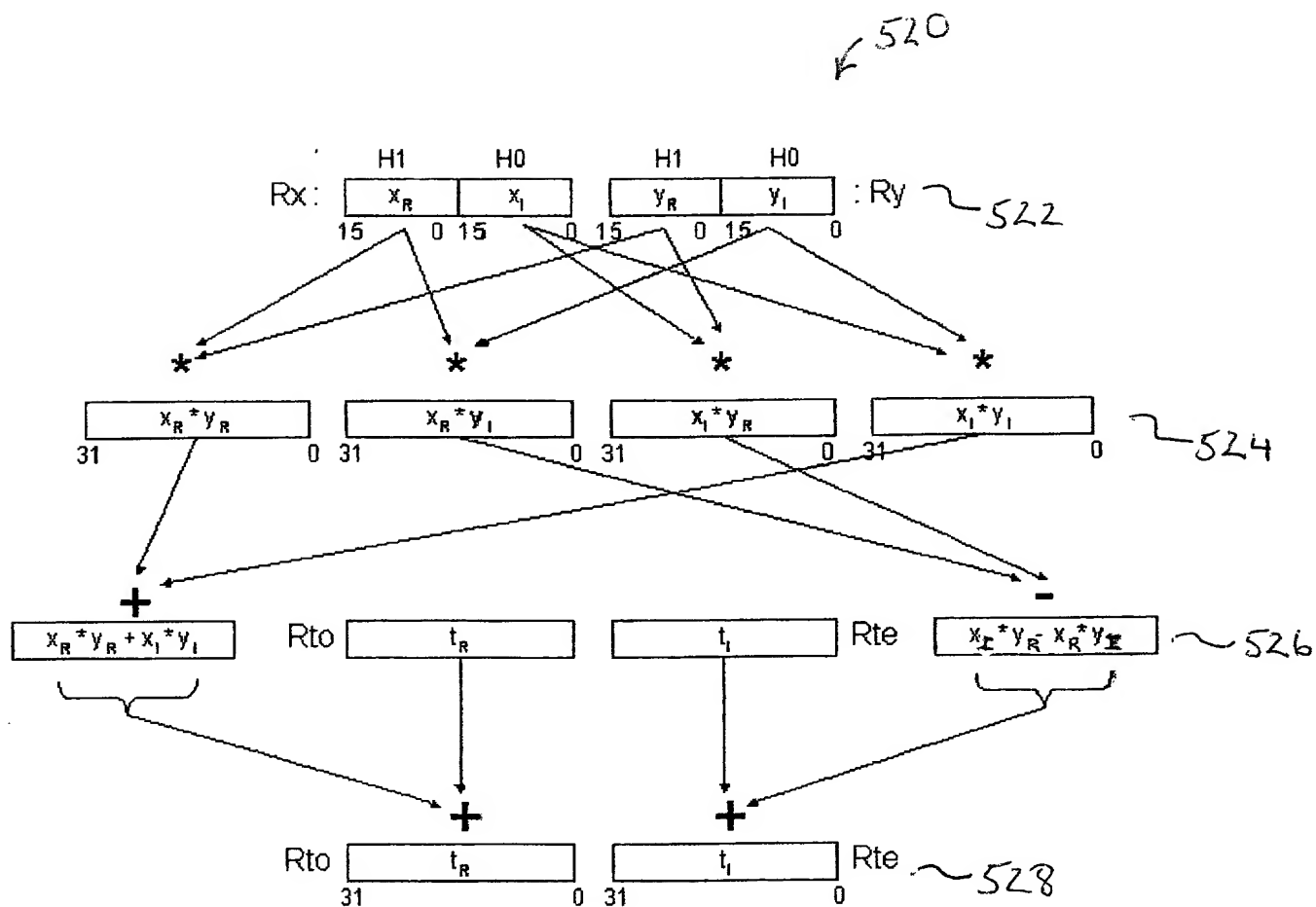


Fig. 5C

## 606

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group		S/P		Unit		MAUopcode					Rte			0		Rx			Ry			CE3		ME							

1-602

1-604

608

4-612

L 614

FIG. 6A

Instruction	Operands	Operation	ACF
MPYCXLXA, [SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXLXA, [NVZ], [SP]M.2SH	Rte, Rx, Ry	$XPR.B0[Rte] \leftarrow XPR.B0[Rte] + (Rx.H1 * Ry.H1 - Rx.H0 * Ry.H0)$ $XPR.B0[Rte] \leftarrow XPR.B0[Rte] + (Rx.H1 * Ry.H0 + Rx.H0 * Ry.H1)$	F1 F0
[TF].MPYCXLXA, [SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

610

N = MSB of result

V = 1 if an integer overflow occurs on either result, 0 otherwise

Z = 1 if a zero result is generated, 0 otherwise

Fig. 6B

1004001004001

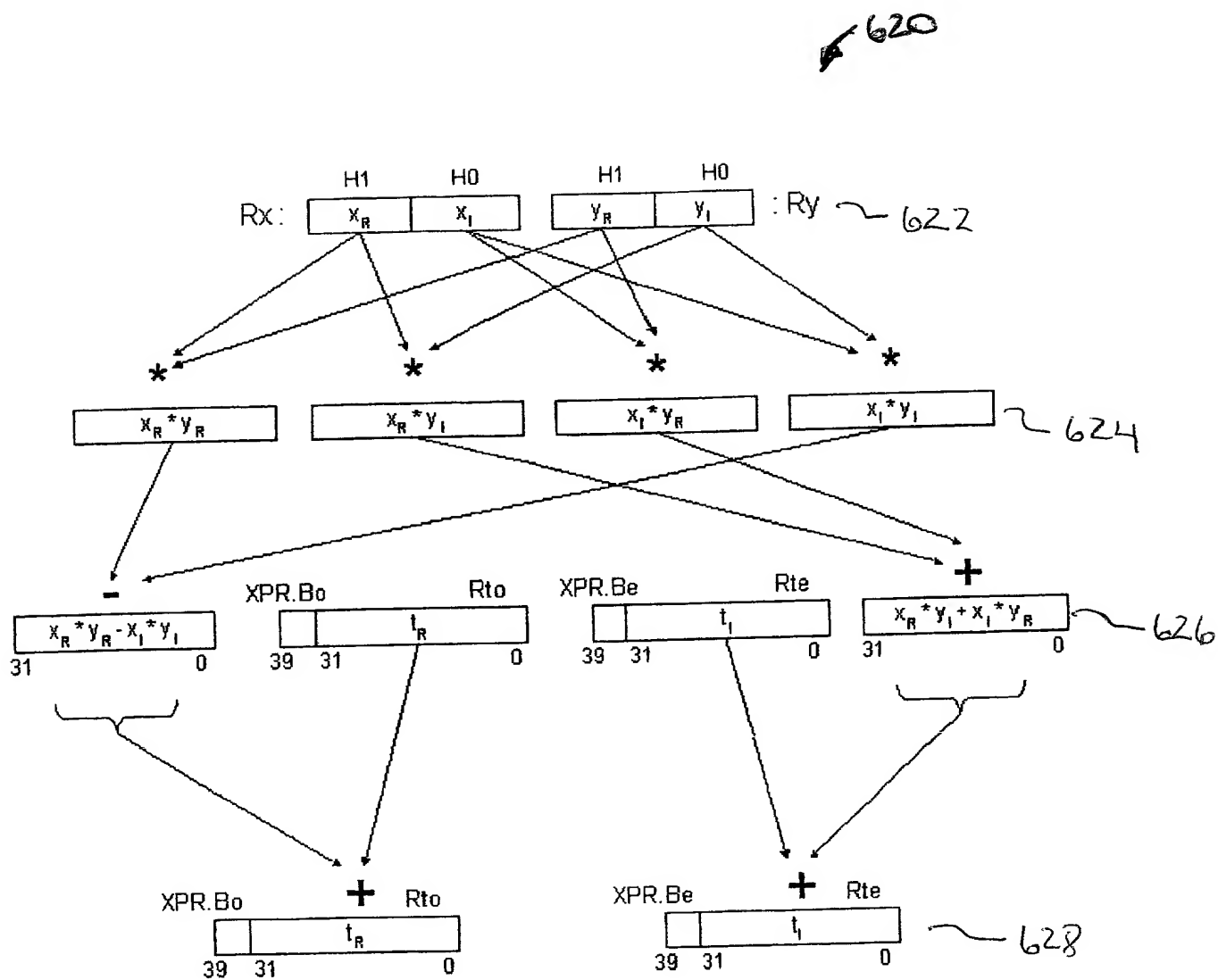


Fig. 6C

# MPYCXJLXA - Multiply Complex Conjugate Long Extended Precision Accumulate

Encoding

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Group	S/P	Unit	MA	Opcode	Rte	0		Rx		Ry	CE3	ME																			

3	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	
1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0
XPR.H1												XPR.H0																			
XPR.B3				XPR.B2				XPR.B1				XPR.B0																			

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	6	5	4	3	2	1	0	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0		
XPR.B0				Rte {0, 4, 8, 12, 16, 20, 24, 28}																											

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	6	5	4	3	2	1	0	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0		
XPR.B1				Rte {1, 5, 9, 13, 17, 21, 25, 29}																											

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	6	5	4	3	2	1	0	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0		
XPR.B2				Rte {2, 6, 10, 14, 18, 22, 26, 30}																											

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	6	5	4	3	2	1	0	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0		
XPR.B3				Rte {3, 7, 11, 15, 19, 23, 27, 31}																											

FIG. 7A

Syntax/Operation	Operands	Operation	ACF
Instruction			Dual Halfwords
MPYCXJLXA.[SP]M.2SH	Rte, Rx, Ry	Do operation below but do not affect ACFs	None
MPYCXJLXA.[NVZ].[SP]M.2SH	Rte, Rx, Ry	$XPR.B0  Rte \leftarrow XPR.B0  Rte + (Rx.H1 * Ry.H1 + Rx.H0 * Ry.H0)$ $XPR.B0  Rte \leftarrow XPR.B0  Rte + (Rx.H0 * Ry.H1 - Rx.H1 * Ry.H0)$	F1 F0
[TF].MPYCXJLXA.[SP]M.2SH	Rte, Rx, Ry	Do operation only if T/F condition is satisfied in ACFs	None

Arithmetic Scalar Flags Affected (on least significant operation (Rte))  
 C *Not affected*  
 N = MSB of result  
 V = 1 if an integer overflow occurs on either result, 0 otherwise  
 Z = 1 if a zero result is generated, 0 otherwise

Fig. 7B

720

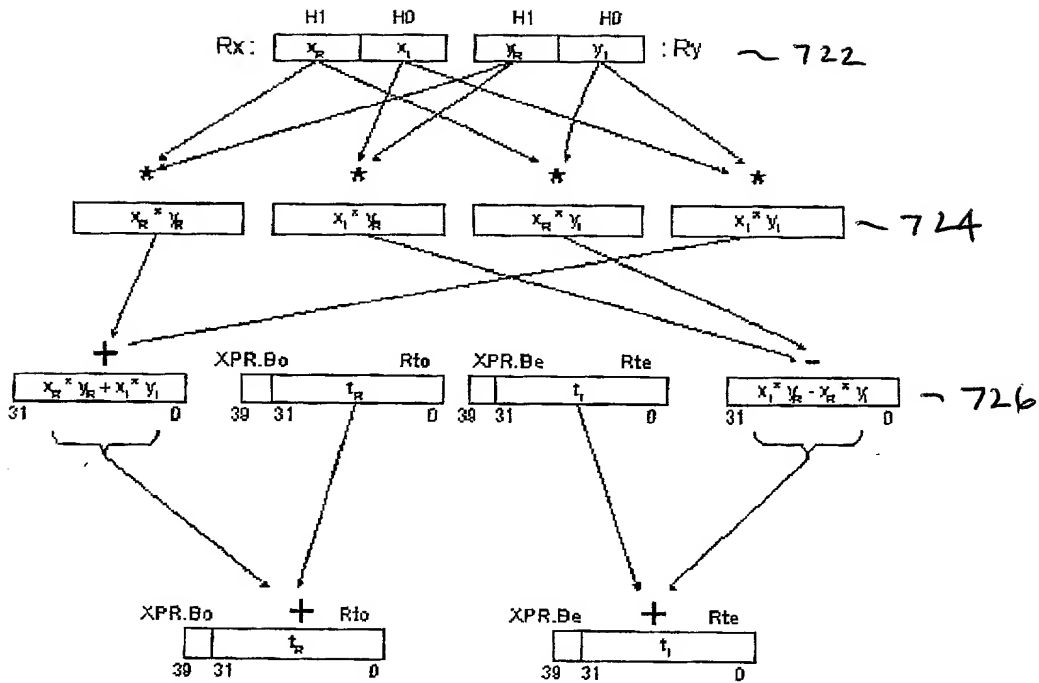


FIG. 7C

Fig. 8

800

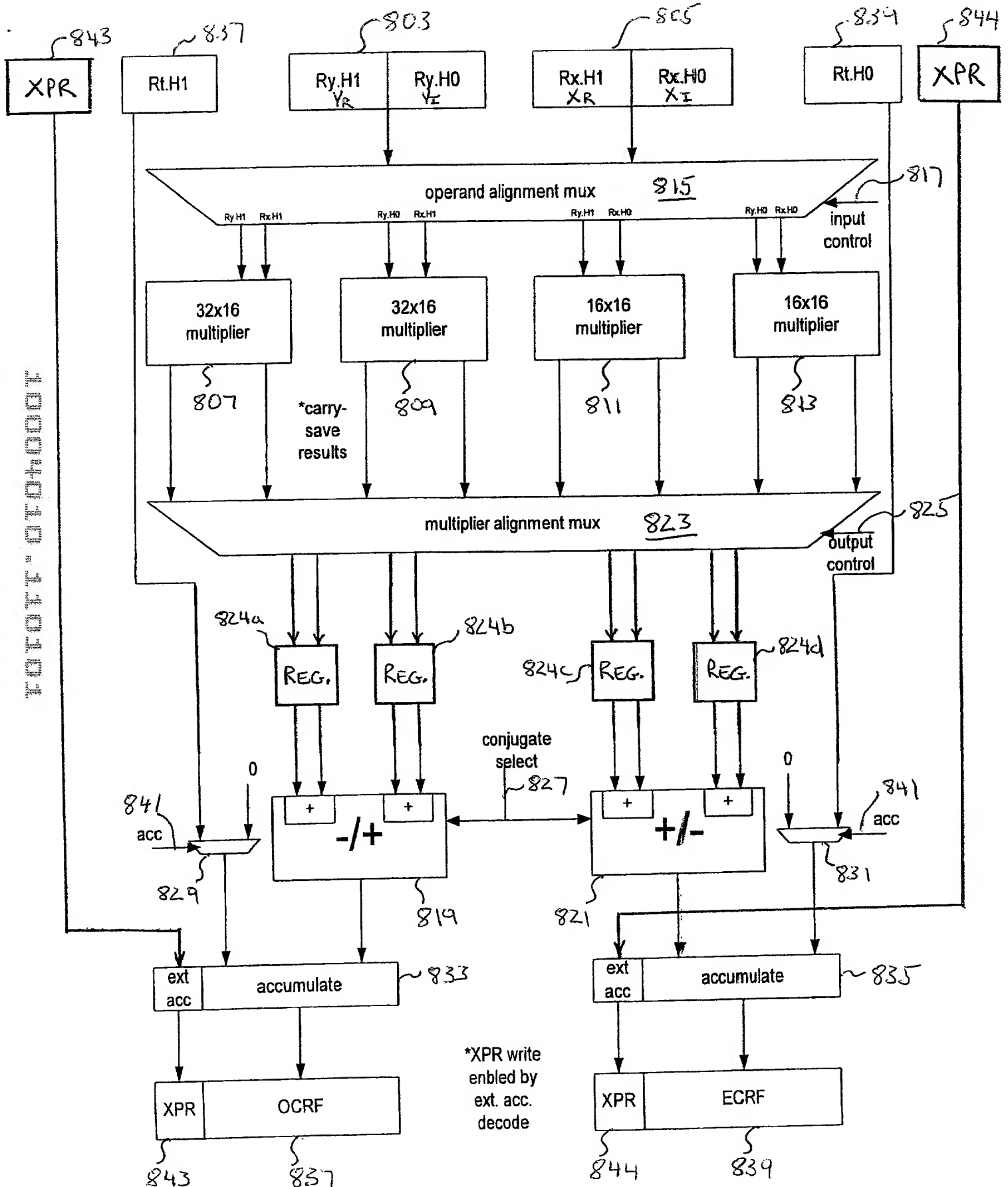
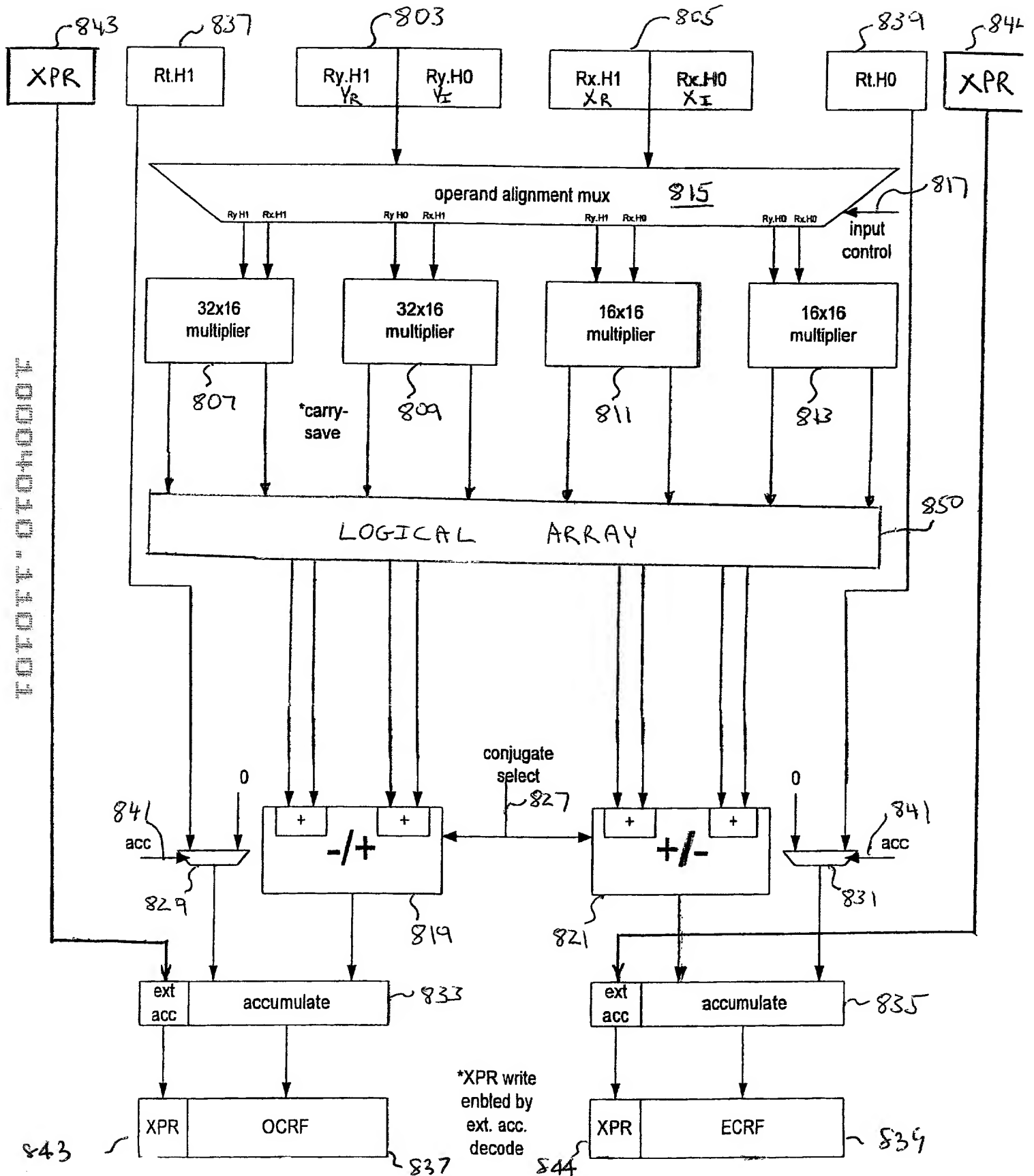


Fig. 9

Fig. 10

800'





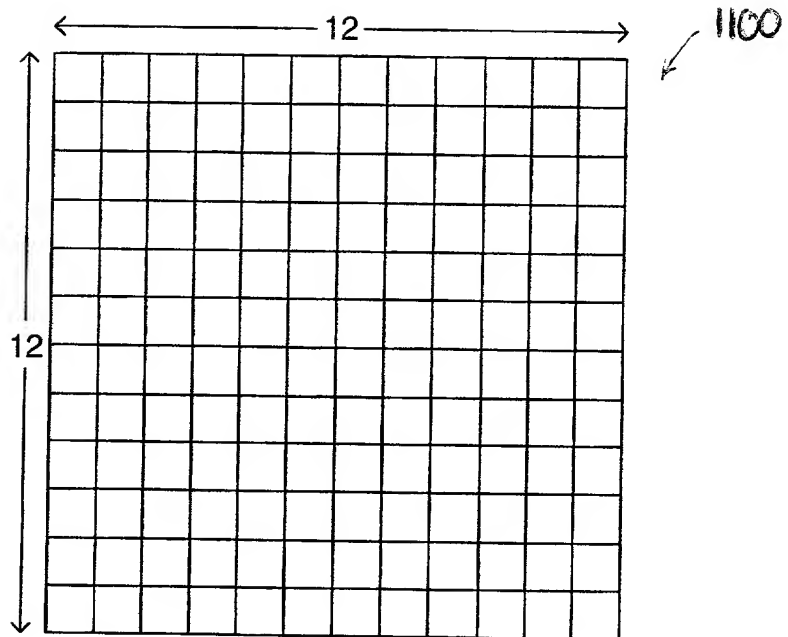


Fig. 11A

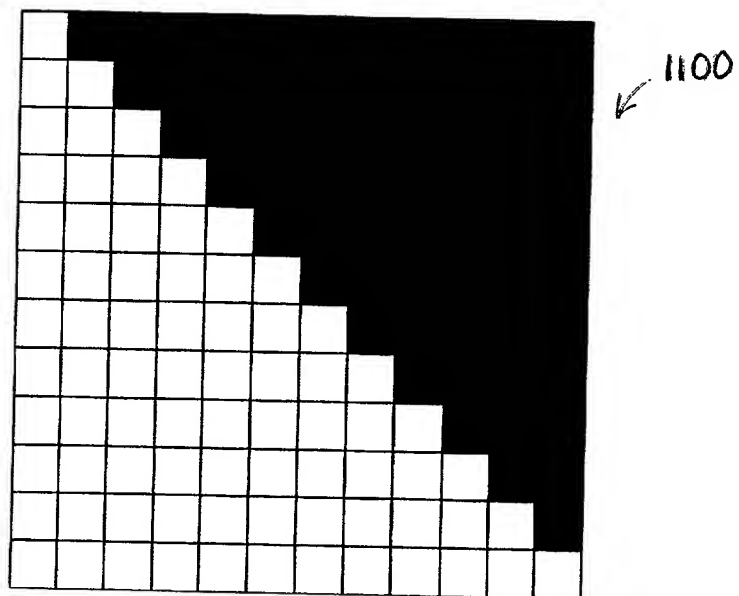


Fig. 11B

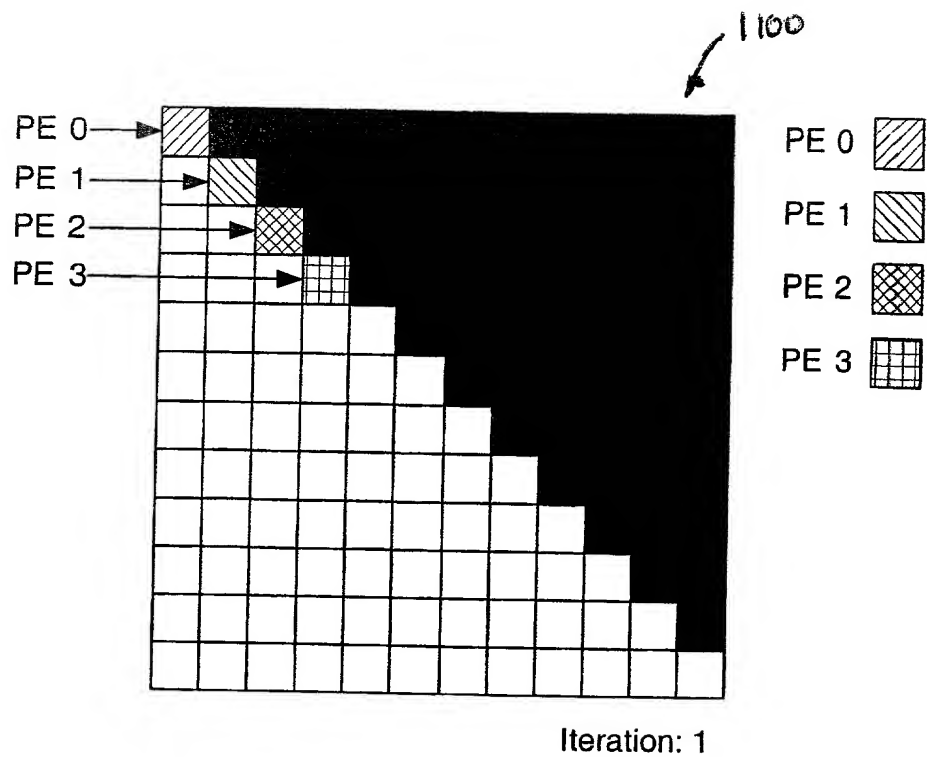


Fig. 11C

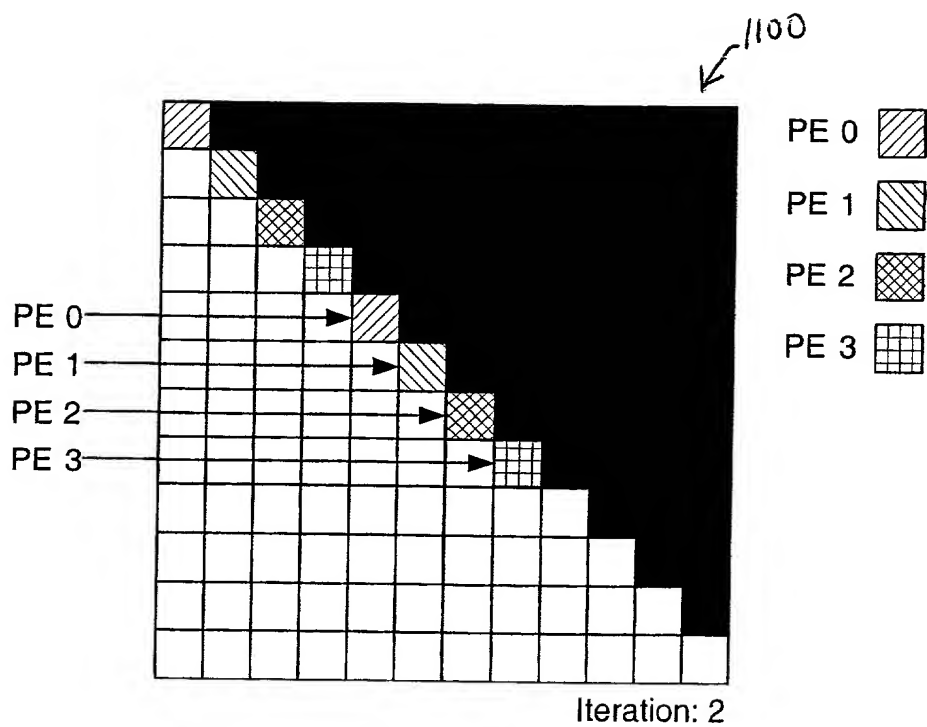


Fig. 11D

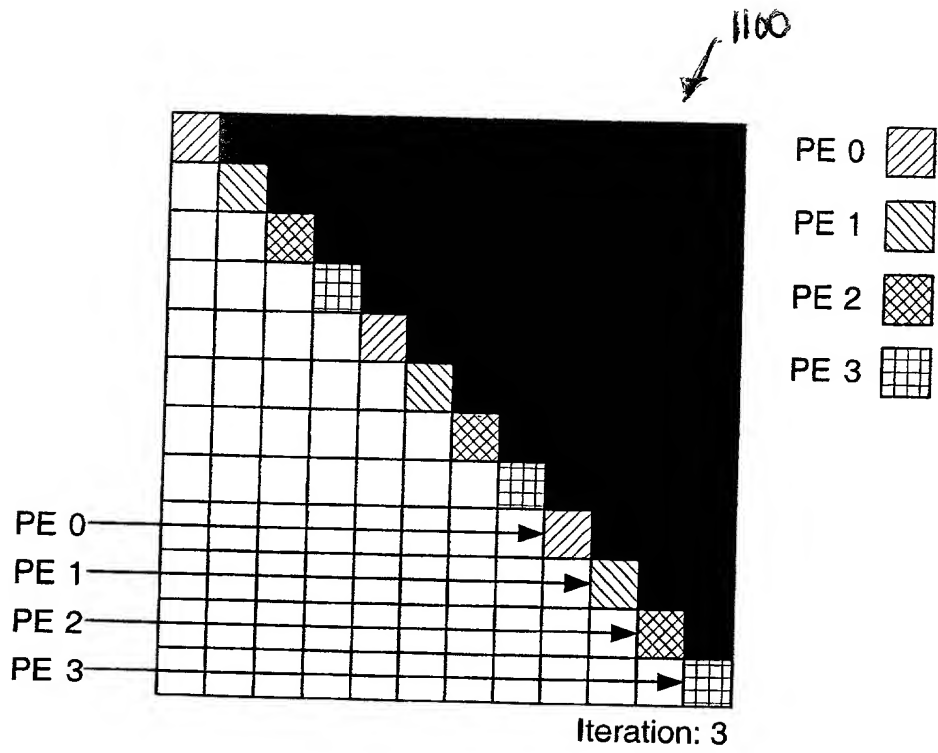


Fig. 11E

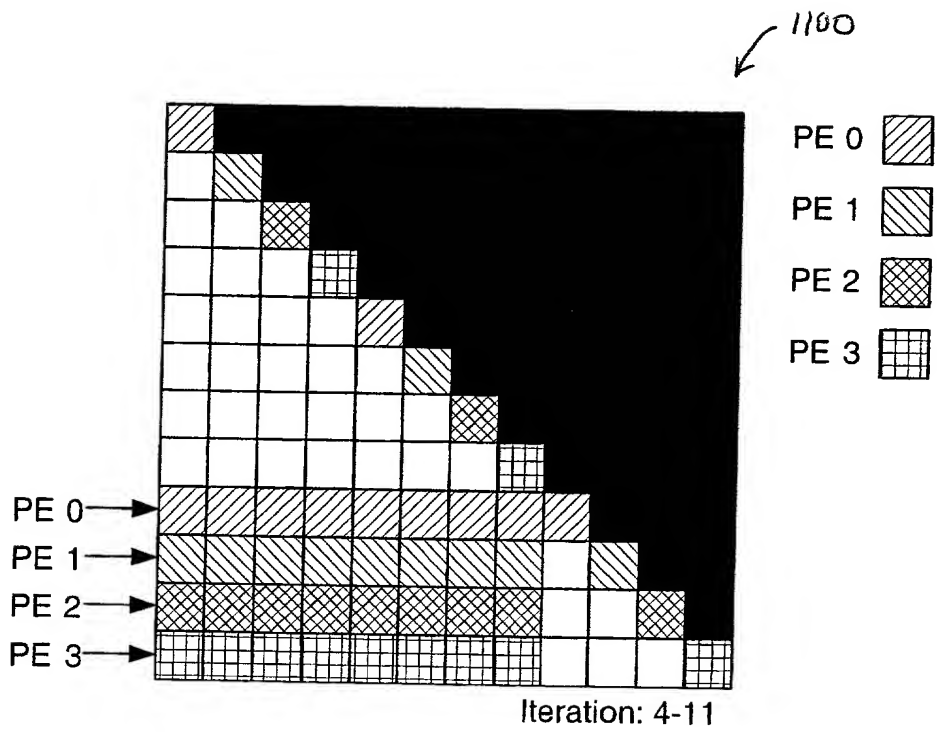


Fig. 11F

1000401010001

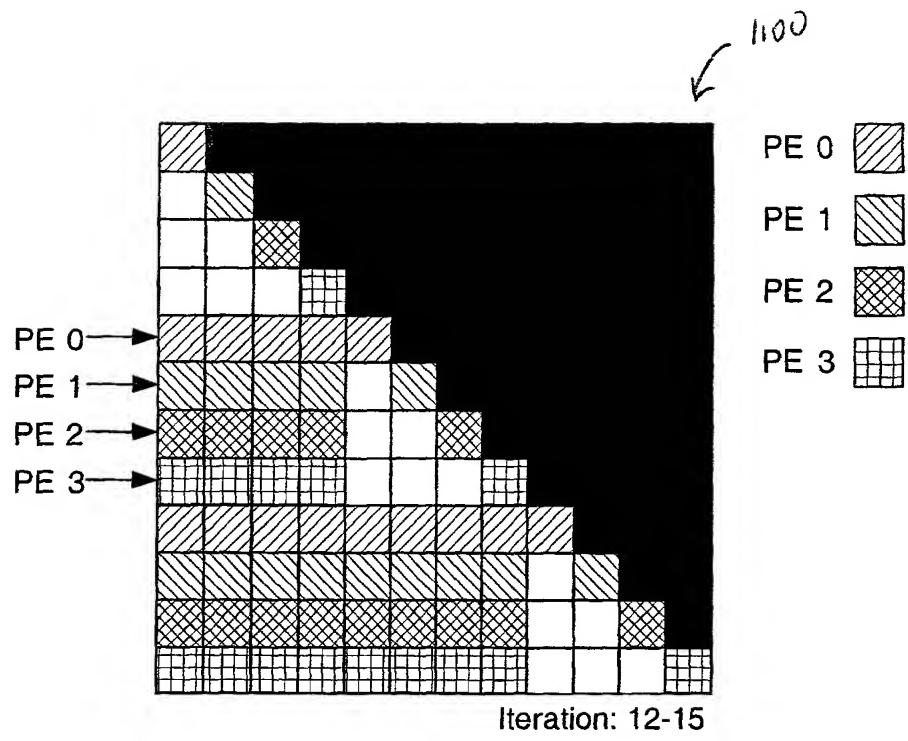


Fig. 11G

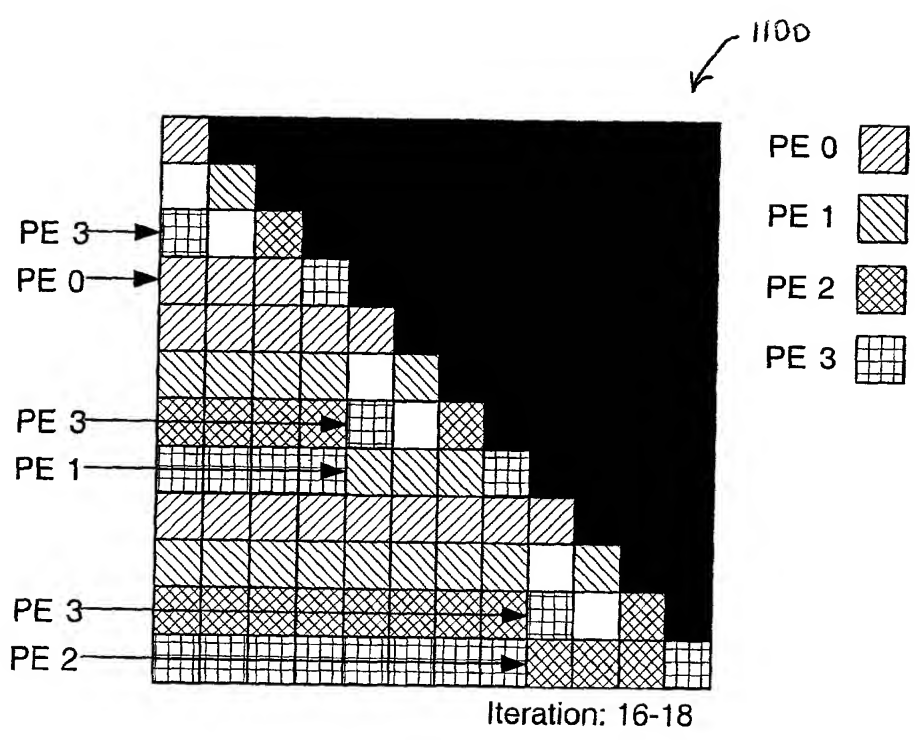


Fig. 11H

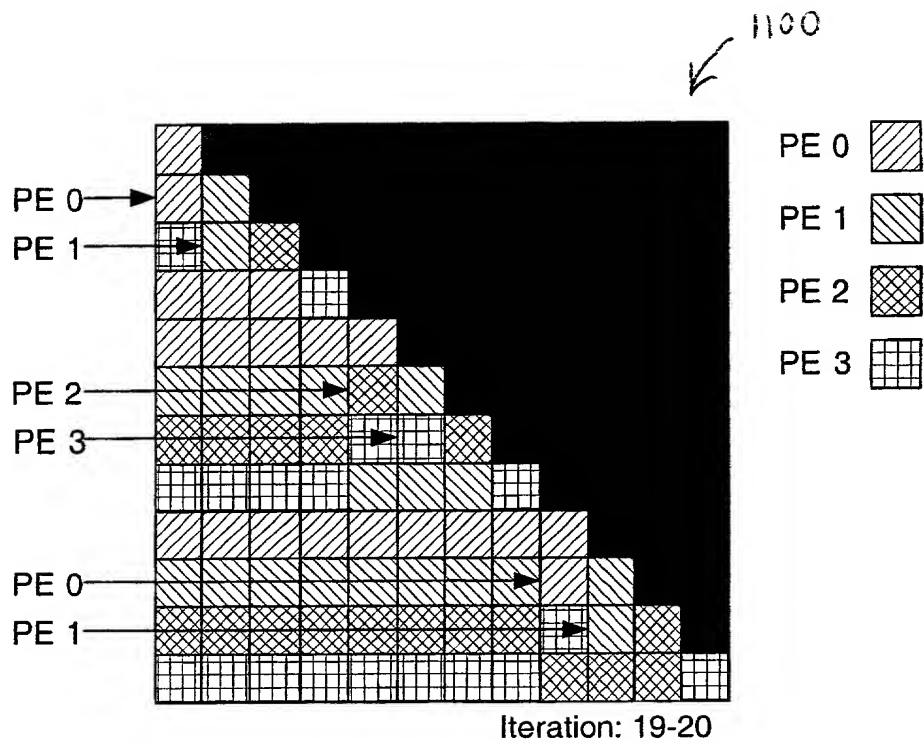


Fig. 11I